

Application No. 10/038,630
Paper Dated May 24, 2004
Reply to USPTO Correspondence of February 24, 2004
Attorney Docket No. 3675-010819

AMENDMENTS TO THE DRAWINGS

The attached drawing sheet of Fig. 3 has been corrected to include the “external control unit” in accordance with the Examiner’s requirement. An annotated copy of Fig. 3 is attached showing the correction as well as a Replacement Sheet.

Attachments: Annotated Sheet (1)
 Replacement Sheet (1)

REMARKS

The Office Action of February 24, 2004 has been reviewed and the Examiner's comments carefully considered. The present Amendment amends claims 1, 11 and 20 in accordance with the originally-filed specification. Supports for these amendments can be found, for example, in paragraphs [0028], [0032], and originally-filed claims 2, 3 and 14. In addition, claims 2, 3 and 14 have been cancelled by the foregoing amendment. Accordingly, claims 1, 4-13 and 15-20 remain in this application.

Initially, the Examiner has objected to the drawings under 37 C.F.R. § 1.83(a) as not showing every feature of the invention specified in the claims. Specifically, the Examiner asserts that the "external control unit" must be shown or the feature cancelled from the claims. According to the Examiner's suggestion, Applicant has modified Fig. 3 in order to schematically illustrate the "external control unit" and amended the specification to conform with this drawing modification. No new matter has been added. Applicant respectfully requests withdrawal of this objection.

All of the pending claims have been rejected. Specifically, claims 1, 4-8, 10-13 and 20 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,018,827 to Shaw et al. (hereinafter "the Shaw patent"). Further, claims 2, 3 and 14-19 stand rejected under 35 U.S.C. § 103(a) as being obvious over the Shaw patent in view of U.S. Patent No. RE37,888 to Cretu-Petra. Finally, claim 9 stands rejected under 35 U.S.C. § 103(a) as being obvious over the Shaw patent in view of "engineering expedient."

Independent claim 1 of the present application, as amended, is directed to a fluid control switch. The fluid control switch includes an adapter element engageable with a switch housing assembly in a fluid control system, and the switch housing assembly includes a switch orifice surrounded by a switch orifice rim. The adapter element includes an activation portion in communication with a signal switch, and the signal switch creates a data signal when the activation portion is activated. Further, the activation portion and the signal switch are arranged

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within the switch housing assembly, such that the activation portion extends at least flush with the switch orifice rim of the switch housing assembly when engaged therewith. The signal switch also comprises an analog/digital signal converter for converting an analog signal, which is heat and/or pressure, and which is received from the activation portion of the adapter element. The converter converts the analog signal to a digital signal. Further, the activation portion creates the data signal through contact without the use of moving parts, such that the activation portion is a non-mechanical activation portion.

Independent claim 11 of the present application, as amended, is directed to a method for retrofitting a fluid control switch to a switch housing assembly having a switch orifice with a switch orifice inner walls having threads disposed thereon and surrounded by a switch orifice rim. This method includes the steps of: (a) providing an adapter element having an activation portion in communication with a signal switch, the signal switch creating a data signal when the activation portion is activated, wherein the signal switch includes an analog/digital signal converter for converting an analog signal, which is heat and/or pressure, received from the activation portion of the adapter element, to a digital signal, and wherein the activation portion creates the data signal through contact without the use of moving parts, such that the activation portion is a non-mechanical activation portion; and (b) arranging the activation portion and the signal switch within the switch housing assembly, such that the activation portion extends at least flush with the switch orifice rim of the switch housing assembly.

Independent claim 20 of the present application, as amended, is directed to a kit for a fluid control system. The kit includes a flow valve in fluid communication with a faucet and a control valve; an external control unit in communication with a control valve; and a fluid control switch having an adapter element configured to be engaged with a switch housing assembly with a switch orifice surrounded by a switch orifice rim. The adapter element includes

an activation portion in communication with a signal switch, which creates a data signal when the activation portion is activated, and a communication line in communication with a signal switch for transmitting the data signal emanating from the signal switch to the external control unit. When the activation portion and the signal switch are arranged within the switch housing assembly, the activation portion extends at least flush with the switch orifice rim of the switch housing assembly. The signal switch also includes an analog/digital signal converter for converting an analog signal, which is heat and/or pressure, received from the activation portion of the adapter element, to the digital signal. The activation portion creates the data signal through contact without the use of moving parts, such that the activation portion is a non-mechanical activation portion. When the signal switch of the adapter element produces a data signal and the data signal is transmitted to the external control unit via the communication line, a second data signal is transmitted to the control valve, activating the control valve, thereby allowing fluid to flow through the flow valve, and further through the faucet associated with the switch housing assembly.

The Shaw patent is directed to a push button assembly for control of plumbing fixtures in prisons and the like. As best seen in Figs. 7-10, a push button plunger 102 extends from the housing 100, with a further portion contained within the housing 100. The plunger 102 extends through a switch orifice 120 and a switch orifice rim. The button 122 allows the user to activate the switch and a sensor 110 includes a resilient electrical lead 112 terminating in a plug 114, which is preferably a modular telephone plug. The push button 122 is in communication with a helical coil spring 104 positioned in the housing 100. Accordingly, the Shaw patent represents known prior art regarding push button assemblies for controlling plumbing fixtures.

The Cretu-Petra patent is directed to a water faucet with touchless controls. In the Office Action, the Examiner is using the Cretu-Petra patent for its disclosure of an analog/digital converter. See column 4, lines 48-52. Further, the Examiner has cited "engineering expedient."

Specifically, this “engineering expedient” allegedly teaches that the adapter element may be made from steel as a matter of design choice. Specifically, the Examiner believes that the use of steel would help in strengthening the connection between the switch housing and the adapter element.

Applicant respectfully submits that the structure and operation of the flush valve retrofit fluid control switch of the present invention is quite different than the structure and operation of the assemblies discussed in the Shaw patent and the Cretu-Petra patent. In particular, the Shaw patent does not disclose an adapter element, which houses the push button assembly. Instead, it appears that the Examiner is considering the push button assembly, or even the push button 102, as the “activation portion,” which is in communication with a signal switch.

The structure and operation of the flush valve retrofit fluid control switch of the present invention differs from the assembly of the Shaw patent and the Cretu-Petra patent in various regards. First, the fluid control switch of the present invention includes an analog/digital converter that converts an analog signal to a digital signal. Further, as specifically set forth in all of independent claims 1, 11 and 20, the analog signal is activated through human contact, such as by heat and/or pressure. Therefore, a user need only touch the activation portion of the adapter element, which allows the signal switch to produce a data signal and transmit this signal to an external control unit, which then activates a control valve, thereby allowing fluid to flow through the electronically-operated flow valve, and further through the faucet associated with the switch housing assembly.

In addition, the activation portion creates this data signal through human contact, but without the use of moving parts. Accordingly, the activation portion is a non-mechanical activation portion. Since the activation portion of the present invention does not include a moving and mechanical structure (such as a spring) the fluid control switch of the present invention has a longer life and much better resiliency.

The Shaw patent expressly teaches a movable push button assembly as is evidenced in the title of the invention, and throughout the specification and claims. As is known in the art, the push button plunger 102 of the assembly of the Shaw patent extends through a switch orifice 120 and allows a button 122 to be pushed by a user. The push button 122 is in communication with a helical coil spring 104 positioned in the housing 100. Therefore, the assembly of the Shaw patent expressly teaches a movable and mechanical structure in order to activate the flow of water through the system. Accordingly, the Shaw patent does not teach or suggest a fluid control switch where the activation portion creates a data signal through contact without the use of moving parts, such that the activation portion is a non-mechanical activation portion, as specifically set forth in independent claims 1, 11 and 20 of the present application, as amended.

With respect to the Cretu-Petra patent, this system teaches a contactless water faucet. The system of the Cretu-Petra patent includes proximity sensors 10, 11 and 12, and each sensor includes an emitter driver 59, an infrared light emitter 62, a phototransistor 9, and a receiver circuit 61 enclosed in a grounded sensor housing. Such contactless systems are well known and have various drawbacks, as they rely upon the user positioning their hand in an exact location that can be sensed by the sensor. Often, a user will simply wave their hands around until the faucet activates, as they have no way of knowing just where the sensor is focusing. Accordingly, the Cretu-Petra patent does not teach or suggest the use of an analog signal that is heat and/or pressure, where the activation portion creates the data signal through contact, as specifically set forth in all of independent claims 1, 11 and 20 of the present application, as amended.

Another novel aspect of the present invention is the arrangement of the activation portion in the signal switch within the switch housing assembly. Such an arrangement within the switch housing assembly provides a unique retrofit structure that is not taught or suggested by

either the Shaw patent or the Cretu-Petra patent. In addition, this arrangement further elucidates the non-mechanical nature of the present invention. The push button assembly of the Shaw patent does not disclose an arrangement, where the "activation portion" (or push button 102), together with a signal switch, are both arranged within the switch housing assembly. There is no motivation to replace a mechanical structure, such as shown in the Shaw patent, with a non-mechanical or electronic structure and assembly, such as is disclosed in the Cretu-Petra patent, as well as the present application. Therefore, the push button assembly of the Shaw patent is further distinguishable from the present invention, as it does not illustrate an assembly having an activation portion and a signal switch arranged within the switch housing assembly, as specifically set forth in independent claims 1, 11 and 20, as amended.

For the foregoing reasons, independent claims 1, 11 and 20 are not anticipated by or rendered obvious over the Shaw patent, the Cretu-Petra patent or any of the prior art of record, whether used alone or in combination. There is no hint or suggestion in any of the references cited by the Examiner to combine these references in a manner which would render the invention, as claimed, obvious. Reconsideration of the rejection of independent claims 1, 11 and 20 is respectfully requested.

Claims 4-10 depend either directly or indirectly from and add further limitations to independent claim 1 and are believed to be allowable for the reasons discussed hereinabove in connection with independent claim 1. Further, claims 12, 13 and 15-19 depend either directly or indirectly from and add further limitations to independent claim 11 and are believed to be allowable for the reasons discussed hereinabove in connection with independent claim 11. Therefore, for all the above reasons, reconsideration of the rejections of claims 4-10, 12, 13 and 15-19 is respectfully requested.

For all the foregoing reasons, Applicant believes that claims 1, 4-13 and 15-20, as amended, are patentable over the cited prior art and in condition for allowance. Reconsideration

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of the rejections and allowance of all pending claims 1, 4-13 and 15-20 are respectfully requested.

Respectfully submitted,

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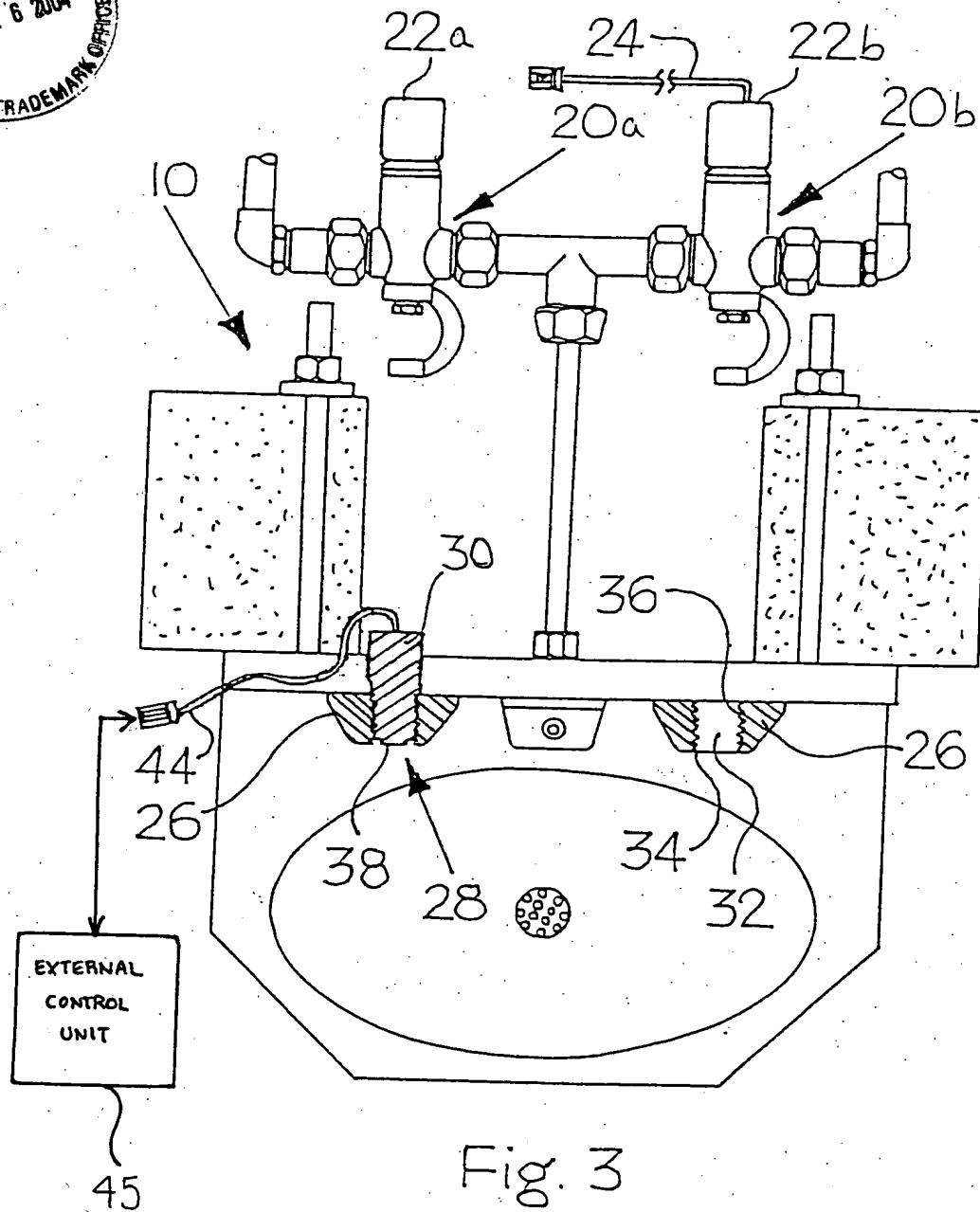


Fig. 3